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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/757,276

01/14/2004

Kevin L. Beaman

MI22-2475

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08/08/2005

WELLS ST. JOHN P.S.

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SPOKANE, WA 99201

EXAMINER

SMOOT, STEPHEN W

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 08/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/757,276

Applicant(s)

BEAMAN ET AL.

Examiner

Stephen W. Smoot

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 January 2004 and 13 May 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 36-55 is/are pending in the application.
- 4a) Of the above claim(s) 46-48 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 36-45 and 49-55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1-14-04; 7-14-04
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This Office action is in response to application papers filed on 14 January 2004, which includes a preliminary amendment that has been entered, and to applicant's election filed on 13 May 2005.

Election/Restrictions

1. Applicant's election of species I, claims 36-45, 49-55, in the reply filed on 13 May 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 46-48 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim.

Claim Objections

2. Claim 52 is objected to because of the following informality:

In claim 52, line 3, delete "is" to correct grammar (compare to claims 50-51).

Appropriate correction is required.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claim 36 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,686,298 B1. Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 1 of '298 has all of the limitations as set forth in claim 36 of the applicant's invention. Regarding the "physically against the substrate" limitation set forth in claim 36, line 3, the term "across at least some of the substrate" as used in claim 1 of '298, lines 3-4 has the same meaning because it implies that the silicon dioxide containing layer is supported by the semiconductor substrate and the applicant defines

"semiconductor substrate" to mean any construction comprising semiconductive material (see page 5, lines 9-15). In other words, the term "physically against the substrate" as used in claim 36, line 3 does not require direct physical contact between the silicon dioxide containing layer and semiconductive material when the applicant's explicit definition of "semiconductor substrate" is used.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 36-45, 49-55 are rejected under 35 U.S.C. 102(e) as being anticipated by Hattangady et al. (US 6,399,445 B1 – from applicant's IDS filed on 1-14-04).

Referring to Fig. 1 and column 3, lines 22-39, Hattangady et al. (US 6,399,445 B1) disclose a method for nitriding a silicon dioxide surface that includes forming a silicon dioxide layer (3) directly on a silicon substrate (1), impinging neutral nitrogen atoms on the exposed upper surface of the silicon dioxide layer (3) to form a nitrided layer (5), and forming a doped polysilicon gate electrode (7) directly on the nitrided layer

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(5). The silicon dioxide layer (3) can have a thickness that ranges from 10 to 30 angstroms and the nitrided layer (5) can have a thickness that ranges from 5 to 10 angstroms.

These are all of the limitations set forth in claims 36, 39, 42-43, 49-52 of the applicant's invention.

Regarding claims 37-38, 40-41, 55, when the silicon dioxide layer (3) is 30 angstroms and the nitrided layer (5) is 10 angstroms, the combined layer thickness is 40 angstroms.

Regarding claims 44, 53, the silicon dioxide layer (3) can be 10 angstroms thick.

Regarding claims 45, 54, the nitrided layer (5) can be 10 angstroms thick.

7. Claims 36-43, 45, 49-52, 54-55 are rejected under 35 U.S.C. 102(e) as being anticipated by Grider, III et al. (US 5,969,397).

Referring to Fig. 2 and column 2, line 26 to column 3, line 52, Grider, III et al. disclose a method for forming a MOSFET with a composite dielectric layer that includes forming a silicon dioxide layer (112) directly on a semiconductor body (104), forming a silicon oxynitride layer (114) on the silicon dioxide layer (112), and forming a conductively doped polysilicon gate electrode (110) directly on the silicon oxynitride layer (114). The silicon dioxide layer (112) thickness can typically range from 15 to 25 angstroms and the silicon oxynitride layer (114) thickness can typically range from 10 to 20 angstroms. The silicon dioxide layer (112) can have no nitrogen content (see

column 2, lines 48-49). The silicon oxynitride layer can be formed by nitrogen doping of an oxide layer (see column 3, lines 17-20).

These are all of the limitations set forth in claims 36, 39, 42-43, 49-52 of the applicant's invention.

Regarding claims 37-38, 40-41, 55, the combined composite dielectric layer thickness can exceed 60 angstroms (see column 2, lines 26-33) and the thickness of the silicon oxynitride layer (114) can typically range from 10 to 20 angstroms.

Regarding claims 45, 54, the silicon oxynitride layer (114) can be 10 angstroms thick.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Holloway (US 6,040,249), Chau et al., (US 6,087,236), and Buchanan et al. (US 6,245,616 B1) teach methods of forming silicon oxide containing gate dielectrics that feature an upper portion that contains nitrogen.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen W. Smoot whose telephone number is 571-272-1698. The examiner can normally be reached on M-F (8:00 am to 4:30 pm).

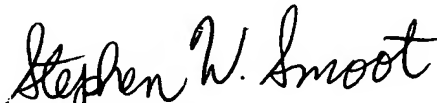
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8000.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SWS


STEPHEN W. SMOOT
PRIMARY EXAMINER